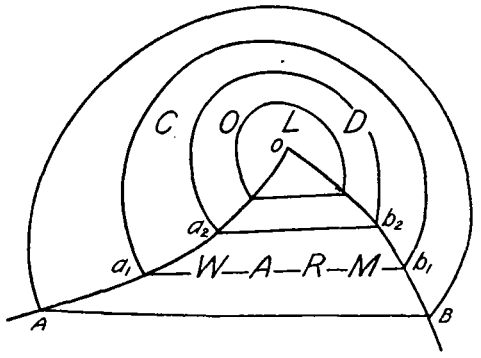
(B) Cyclones in which there is no warm sector at the surface of the earth.

Generally speaking, class A are growing cyclones which usually move with increasing speed as they grow, and class B are dying cyclones which tend to become stationary. In the method of averages these two classes were treated simply as one class, and naturally the result of such treatment could not be very satisfactory. When they are treated separately, as they should be, it is found (and this is a discovery of fundamental importance) that the centers of cyclones of class A move in the direction of motion of the air in the warm sector and very nearly with the speed of motion of that warm air (the direction of motion of this air is taken to be along the isobars and its speed about three-quarters of the speed of the "gradient wind"). A diagrammatic representation of such a cyclone is given in the figure.



OAB is the warm sector; OA and OB are the lines of discontinuity dividing the warm air from the cold air. The lines a_1 b_1, a_2 b_2, etc., are isobars; they are drawn straight because in practice they are found to be nearly straight in the warm sector. The direction of motion of the center O is parallel to AB and its speed is determined by the distance between the isobars (more strictly by the distance between the isobars multiplied by the sine of the latitude). As the whole system is moving in the direction of motion of the warm air, AB is naturally a changing direction, but the change takes place continuously, and not as a rule very rapidly.

(Usually AB "backs" so that the path of the center O tends to curve toward the left; this is practically always the case with a large cyclone; but sometimes, with a small cyclone moving along the edge of a warm anticyclone the change is in the opposite direction.)

This discovery does constitute a great step forward in our knowledge. But if the discovery applied only to those depressions which have a properly constituted warm sector, its application would be limited to a comparatively small number of occasions, though occasions of great importance. As I mentioned above, much of our weather is associated with nearly stationary depressions, and the Bergen school have discovered that in these depressions we get discontinuities having the same characteristics of weather as those found in the neighborhood of the discontinuities between the warm and the cold air in the normally constituted cyclones; and these discontinuities in the stationary cyclone move in the direction and with the approximate speed of the air in the sector which has the weather characteristics of a warm sector.

There are, however, occasions when the discontinuity in the stationary cyclone is practically a single discontinuity and no distinctive warm sector can be identified; in such cases the discontinuity moves around the cyclone at a speed equal to the component of the colder wind at right angles to the line of discontinuity. There is one other case which should be mentioned—that of a secondary cyclone developing in, and usually to the south of a dying cyclone. Such a secondary, if it has a warm sector, has its motion determined by that warm sector. If it has no warm sector, then it moves around the primary cyclone like any other discontinuity.

To return to the consideration of the constitution of the cyclone, those classed above as A eventually lose their warm sector and change into class B. Actually the warm sector only disappears at the earth's surface; the warm air which constitutes the sector is lifted up by the colder air and the discontinuity which has disappeared at the surface will continue to exist at greater heights. If the change from class A to class B takes place while the center is still over the Atlantic (or in such a position that the major part of the depression is over the Atlantic) discontinuities develop in the depression owing to the variation in the temperature of the ocean and the resulting variation in the temperature of the air. The (cold) air as it approaches the southern regions of the depression gets warm, and by the time it has made the circuit and come back to the region of France or the British Isles it may have become warm air relative to the air over these lands. It will never be quite so effective as warm air which has come up into a depression from the equatorial regions, but it is sufficiently warm to produce on a small scale the characteristic weather phenomena of the large "normally constituted" depression.

This note is only intended to give some indication of the way in which the question put by our correspondent is being answered. It is not possible to give in simple language in a short article anything like a complete account of the results of the long technical investigations of other people, nor to explain in detail all the precautions necessary in practice to prevent oneself being misled by peculiarities in observations taken at the earth's surface. (*Reprinted from the Meteorological Magazine, April, 1926.*)

RESUMPTION OF "GERLAND'S BEITRÄGE ZUR GEOPHYSIK"

The scientific world will welcome the return of this very valuable publication to the service of international geophysics. From the preface to volume 15 we take the following excerpts:

The first volume of "Gerland's Beiträge zur Geophysik" appeared in the year 1887. Originating from a collection of treatises of the geographical seminary conducted by G. Gerland of Strasburg, Alsatia, the "Beiträge" developed into a predominating geophysical publication of international character. The 14 volumes existing contain many treatises, partly fundamental, taken from a great number of fields of geophysical research. The series reflects the history of this science for a period of 30 years. The war, which put an end to many enterprises of civilization, also interrupted the publication of Gerland's "Beiträge." Being an international scientific organ, it was brought to ruin through the tendencies attaching to the institution of war. The last number appeared in 1918.

In view of the gradual return to normal conditions we may hope that the good intention of the publisher, who intends to issue "Gerland's Beiträge" again, will contribute to some extent to the reconstruction of international scientific work. Thanks are due to the publisher for his interprise which is to serve an ideal purpose. But thanks must be returned particularly to our colleagues in neighboring and distant countries, in Germany and in my native country of whom only a small number will be found in the official list of collaborators. The many tokens of sympathy they have evinced and the large number of treatises I have received have given me the courage and the right to recreate the tradition of "Gerlands' Beiträge zur Geophysik." * * *

True to the tradition of the "Beiträge," these pages will be placed at the disposal of scientists in every country of the world. In consideration of the fact that contributions may be submitted

in German, English, and French, thus facilitating difficulties of expression, all colleagues should be in a position to cooperate. There is no limit to the length of the contributions to "Gerland's Beiträge zur Geophysik," and the use of foreign languages will be an appreciated attribute. * * *

In general, the more detailed abstracts and reviews will replace the usually short ones. A list of the literature treating with geophysical research during the years 1914–1923 will be issued later on. On both sides the war interrupted the regular exchange of publications. The interruption thus caused—the gap brought about by the war—will be repaired as far as humanly possible.

The collaborators will be presented with 50 reprints of their treatises.

The publication will appear in single numbers, but will be calculated by volumes. Every effort will be made to publish the treatises as quickly as possible. Treatises should be submitted to the editor, who also replies to all questions.

The editor: Prof. Dr. V. Conrad, Mariahilferstr. 91, Vienna.
The publisher: Akademische Verlagsgesellschaft m. b. H., Leipzig.

TORNADO CLOUDS AT TOPEKA, KANSAS, JUNE 16, 1926

By S. D. FLORA, Meteorologist

Two small tornado clouds appeared at the eastern edge of Topeka at about 5 p. m. of June 16, moved east in almost parallel paths, and dissipated without serious damage.

One of these apparently originated at the eastern edge of North Topeka, just north of the Santa Fe shops. A man who saw the formation of the cloud stated it was caused "by two clouds coming together"—a very common observation of the origin of a tornado cloud.

The only member of the office force who witnessed the cloud was E. C. Corkill, junior observer, who first noted it from the office window at Fifth and Kansas Avenues, about 2 miles distant in an air line. Mr. Corkill first noticed it at 5.08 p. m., apparently a minute or two after it formed. His report states the upper part of the cloud was funnel shaped, extending down from an exceptionally threatening thunderstorm cloud. The lower part of this funnel terminated in a long light grey cloud, resembling an enormous rope dangling from it. A small boy who saw this cloud reported it was a "snake in the sky." This rope-shaped cloud seemed to drag from the parent funnel, twisting itself almost at right angles at times and darting towards the ground but, apparently, never quite reaching it, as seen from the office window. Subsequent events showed, however, that it extended to the ground once just east of the county line, about 4 miles from its point of origin. At this place, between the Union Pacific tracks and the Kansas River, near the old Jesse Willard farm, occurred the only damage that was reported. Several small farm buildings sustained minor damage, some trees were blown down, and a farm hand was picked up and carried about 60 feet and let down with no injury except a bad fright and a coating of mud.

The cloud disappeared about a mile east of this point by gradually drawing up into the thundercloud above, maintaining its funnel shape to the last. Mr. Corkill noted its disappearance at 5.17 p. m., which gave its rate of progression as about 5 miles in nine minutes.

The other cloud was first noted at about 5 p. m. just east of the city ball park, about 3 miles north of the cloud first described. It was practically of the same type and was in sight for about the same length of time. So far as could be ascertained it failed to reach the ground and did no damage whatever.

A display of mammato-cumulus clouds, covering about a tenth of the sky, preceded the tornado clouds a few minutes.

Another tornado cloud of about the same type was observed at about the same time 14 miles southwest of Topeka, 2 miles east of Auburn, moving east. It failed to reach the ground and did no damage.

THE WINTER 1924–25 IN ITALY

L. Borriello in *La Meteorologia Practica* for March–April, 1926, discusses the winter of 1924–25 in Italy, using the records of eleven stations well distributed over that country. Each of the winter months, December, January and February were warm, the average deviation from the normal being +1.5, +1.2 and +1.5° C., respectively. The cause of the warm winter is ascribed to the pressure distribution over central and southern Europe.—*A. J. H.*

FIRST WARNINGS OF FOREST-FIRE WEATHER IN ALASKA

The editor is informed that the first warnings of weather conditions favorable to the inception and spread of forest fires in Alaska were issued by the Juneau (Alaska) Office of the United States Weather Bureau on June 18, 19, 21, and 22 of the present year.

HEAVY RAINS AND DAMAGING FLOODS IN VARIOUS REGIONS

The outstanding feature of press reports which reach the editor is the wide-spread occurrence of flood-producing rains as indicated below:

(1) Rains in the last half of June in Hawaii broke a 5-months' drought in the islands of the group and greatly improved the agricultural situation.

(2) Heavy rains and floods occurred in central and western Europe in May and continued in parts of the Balkans and elsewhere in June, 1926, with some loss of life and great damage to crops.

(3) Six thousand families homeless and a loss of life, estimated at 1,000 persons, are reported incident to the bursting of a dam as the result of torrential rains in the vicinity of Leon, Guanajuato, a city of 65,000 inhabitants, situated in the midst of a highly cultivated agricultural district of Mexico about 1,000 miles south of the Rio Grande. Subsequent reports from Mexico show a continuation of heavy rains during July with much flooding in the great central valley in which Mexico City is situated.—*A. J. H.*

METEOROLOGICAL SUMMARY FOR SOUTHERN SOUTH AMERICA

By Senior J. B. NAVARRETE

[El Salto Observatory, Santiago, Chile]

During May occurred important meteorological changes which brought the beginning of the normal rainy season in the central zone. The paths of the low centers inclined progressively toward the north.

Between the 3d and 7th low pressure dominated the far south, falling to a minimum of 737 mm. on the 5th at Punta Arenas. Bad weather with frequent rains covered the whole southern zone as far north as Concepcion Province. The maximum precipitation for 24 hours was recorded on the 4th at Cabo Raper, 32 mm.

Between the 6th and 14th, pressure rose in the south, setting up anticyclonic control, with general fine weather, cold and frosts.

Between the 15th and 18th a new depression crossed southern South America, causing bad weather and rains as far north as Concepcion. Maximum precipitation for 24 hours was recorded on the 17th at Valdivia, 29 mm.